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APPENDIX APLANTS FOR THE PRODUCTION OF SYNTHETIC AND RECLAIMED RUBBERA. Synthetic Rubber

All known synthetic rubber plants in areas of the Free World are listed, with production by plant if known.

In such countries as Sweden and Italy, where plant facilities exist for the production of synthetic rubber but where no rubber is presently being produced, capacities as known are given.

For the United States, it is noted that feed stock plants (plants which produce styrene or butadiene for final processing by co-polymer plants) are also listed. As can be seen by this list, all the styrene used as feed stock is made in only six plants, and destruction of any one of these plants would reduce by that much the output of GR-S (butadiene-styrene rubber) until the unit could be restored to production. Butyl rubber, important for manufacture of inner tubes, is produced in only two plants, and neoprene in but one plant. Thus styrene, butyl, and neoprene, all of which are highly important to the rubber industry of the United States, appear to be the most vulnerable points in the synthetic rubber industry.

B. Reclaimed Rubber

Locations and names of installations for the reclaiming of rubber are given, where known, for all countries. Information on such facilities is not regularly reported, and cannot be considered for certain countries (for example, France) which reportedly has considerable capacity for reclaimed rubber, but for which no data on locations of plants or actual output are available.

Reclaimed rubber is a very valuable raw material and serves as an important factor in enabling countries to increase rubber fabrication at relatively small cost in comparison to synthetic and natural rubber. The facilities for reclaiming are not difficult or expensive to provide and production can be increased or decreased as desired with relative ease.

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APPENDIX A.Part A.SYNTHETIC RUBBER PLANTS IN THE FREE WORLD AREA DURING 1951

| <u>Location</u> | <u>Name of Plant</u> | <u>Design Capacity^{a/}</u> (in long tons) | <u>Production^{b/}</u> |
|---|---|---|--------------------------------|
| <u>NORTH AMERICA</u> | | | <u>907,443</u> |
| <u>CANADA</u> | | | <u>62,293</u> |
| Sarnia, Ontario | Polymer Corporation | | 62,293 |
| <u>UNITED STATES^{c/}</u> | | | <u>845,151</u> |
| <u>Copolymer plants (GRS and N)</u> | | | |
| Alcona, Ohio | Firestone Tire & Rubber Co. | 25,000 | |
| | *Firestone | 2,000 | |
| | *Goodrich | 9,000 | |
| | *Goodyear | 9,000 | |
| | Goodyear Synthetic Rubber Corp. | 23,000 | |
| Baton Rouge, La. | Copolymer Corp. | 43,000 | |
| | *U.S. Rubber Co. | 7,000 | |
| Baytown, Texas | General Tire & Rubber Co. | 37,000 | |
| Boonton, Mass. | *Doway & Almy | 3,000 | |
| Borger, Texas | Phillips Chemical Co. | 54,000 | |
| Houston, Texas | Goodyear Synthetic Rubber Corp. | 87,000 | |
| Institute, W. Va. | B.F. Goodrich Chemical Co. | 113,000 | |
| Louisville, Ky. | *B.F. Goodrich Co. | 15,000 | |
| | Kentucky Synthetic Rubber Corp. | 37,000 | |
| Lake Charles, La. | Firestone Tire & Rubber Co. | 86,000 | |
| Midland, Mich. | Dow Chemical Co. | 3,000 | |
| Naugatuck, Conn. | U.S. Rubber Co. | 25,000 | |
| Port Neches, Texas | B.F. Goodrich Co. | 78,000 | |
| | U.S. Rubber Co. | 76,000 | |
| Torrance, Calif. | Midland Rubber Corp. | 76,000 | |
| | | 808,000 | 712,147 ^{d/} |
| <u>Necorene plants</u> | | | |
| Louisville, Ky. | *E.I. DuPont de Nemours & Co. | 60,000 | 58,907 |
| | | 60,000 | |
| <u>Butyl plants</u> | | | |
| Baton Rouge, La. | Esso Standard Oil Co. | 40,000)** | |
| Baytown, Texas | Humble Oil & Refining Co. | 40,000) | |
| | | 80,000 | 74,105 |
| Total, U.S. synthetic rubber capacity | | 948,000 | |
| <u>Feedstock plants (in short tons)</u> | | | |
| <u>Butadiene</u> | | | |
| Baton Rouge, La. | *Esso Standard Oil Co. | 20,000 | |
| | Copolymer Corp. | 22,000 | |
| Baytown, Texas | Humble Oil & Refining Co. | 45,000 | |
| Borger, Texas | Phillips Chemical Co. | 60,000 | |
| Kobuta, Pa. | Koppers Co., Inc. | 105,000*** | |
| Lake Charles, La. | Cities Service Refining | 62,000 | |
| Louisville, Ky. | Carbide & Carbon Chemicals Corp. | 70,000*** | |
| Midland, Mich. | *Dow Chemical Co. | 2,000 | |
| Port Neches, Texas | Neches Butane Products Co. | 168,000 | |
| Texas City, Texas | *Carbide & Carbon Chemical Corp. | 6,000 | |
| Houston, Texas | Sinclair Rubber, Inc. | 78,000 | |
| Torrance, Calif. | Shell Chemical Corp. & Standard Oil Co. of California | 45,000 | |
| | | 753,000 | 683,000 |

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APPENDIX A. (Cont'd)

| <u>Location</u> | <u>Name of Plant</u> | <u>Design Capacity^{a/}</u> (in long tons) | <u>Production^{b/}</u> |
|--------------------------------|-----------------------------------|---|--------------------------------|
| <u>Styrene</u> | | | |
| Institute, W. Va. | *Carbide & Carbon Chemical Corp. | 15,000 | |
| Kobuta, Pa. | *Koppers Co., Inc. | 50,000 | |
| Midland, Mich. | *Dow Chemical Co. | 36,000 | |
| Texas City, Texas | *Monsanto Chemical Co. | 65,000 | |
| Torrance, Calif. | Dow Chemical Co. | 57,000 | |
| Valasco, Texas | *Dow Chemical Co. | 100,000 | |
| | | 323,000 | |
| <u>WESTERN EUROPE</u> | | | |
| <u>FRANCE</u> | Planned | | 922 |
| | | | None |
| <u>GERMANY, WEST</u> | | | 929 |
| Mils Leverkusen | Chemische Werke Mils Fayrwerke | | |
| <u>ITALY</u> | | | None |
| Ferrara Terni | Pirelli & I. R. I. | 12,000 N.A. | |
| <u>SWEDEN</u> | | | None |
| Lugavik Stockvik Uppsala | | 800 800 Experimental | |
| <u>GRAND TOTAL</u> | | | 908,377 |

- a. Design capacity is given where available to show possible production.
 b. Production is given to show actual output. In the U. S. information is not available as to actual production by plant.
 c. Polymerization plants and feed stock plants are given where known. The use of oil extenders and the cold rubber process of synthetic rubber production has increased plant capacities. The polymerization capacities have been increased in the last two years, and the capacities, as shown, represent 1952 information.
 d. Includes 696,814 tons GR-S and 15,333 tons N-type rubber.

- * Privately owned facilities, all copolymer plants include N and GR-S types of rubber.
 ** Increased to 90,000 tons capacity.
 *** In addition, there is one unit of approximately 35,000 ST/Yr capacity in standby at this plant.

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APPENDIX A. (Cont'd)Part B.RECLAIMED RUBBER PLANTS IN THE FREE WORLD AREA DURING 1951^a

| <u>Location</u> | <u>Name of Plant</u> | <u>Design Capacity^b</u> (in long tons) | <u>Production^c</u> |
|--|---------------------------------------|--|-------------------------------|
| <u>NORTH AMERICA</u> | | | |
| <u>CANADA</u> | | | |
| Montreal | Dominion Rubber Co.* | | 371,987 |
| | | | 5,077 |
| * Subsidiary of U.S. Rubber Co. and the only important producer in the country. | | | |
| <u>CUBA</u> | | | |
| Mantanzas | | | 77 |
| <u>UNITED STATES</u> | | | |
| Akron, Ohio | Goodyear Tire & Rubber Co. | | |
| Akron, Ohio | Kylos Rubber Company | | |
| New Brunswick, N.J. | Laurie Rubber Reclaiming Co. | | |
| Naugatuck, Conn. | Naugatuck Chemical Co. | | |
| Buffalo, N.Y. | U.S. Rubber Reclaiming Co. | | |
| Trenton, N.J. | Nearpara Rubber Co. | | |
| Butler, N.J. | Pequanoc Rubber Co. | | |
| E. St. Louis, Ill. | Midwest Rubber Reclaiming Co. | | |
| Memphis, Tenn. | Firestone Tire & Rubber Co. | | |
| Gadsden, Ala. | Goodyear Tire & Rubber Co. | | |
| Los Angeles, Calif. | Goodyear Tire & Rubber Co. | | |
| Tuscaloosa, Ala. | B.F. Goodrich Co. | | |
| Los Angeles, Calif. | B.F. Goodrich Co. | | |
| Erie, Pa. | Continental Rubber Co. | | |
| Chicago, Ill. | Dryden Rubber Co. | | |
| Denver, Colorado | Gates Rubber Co. | | |
| Buffalo, N.Y. | Dunlop Rubber Co. | | |
| Barberton, Ohio | Seiberling Rubber Co. | | |
| Passaic, N. J. | Manhattan Rubber Co. | | |
| Painesville, Ohio | Ohio Rubber Co. | | |
| <u>SOUTH AMERICA</u> | | | |
| <u>ARGENTINA</u> | | | |
| Buenos Aires | Goodyear Neumaticos SA | 1,350 | 5,073 |
| Note: There are several small rubber goods manufacturers who produce small quantities of reclaimed rubber. | | | |
| <u>BRAZIL</u> | | | |
| Santo Andre | Industria de Pneumaticos Firestone SA | | |
| Mao Paulo | Cia Goodyear do Brasil | | |
| <u>CHILE</u> | | | |
| Santiago | Industria Nacional de Pneu (INSA) | | 2.5 |
| <u>COLOMBIA</u> | | | |
| Cali | Cia Croydan del Pacifico SA | | N.A. |

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APPENDIX A. (Cont'd)

| <u>Location</u> | <u>Name of Plant</u> | <u>Design Capacity^{a/}</u> <u>(in long tons)</u> | <u>Production^{b/}</u> |
|-----------------------------------|--|--|--------------------------------|
| <u>COSTA RICA</u> | | | <u>6.7</u> |
| <u>GUATEMALA</u> | | | <u>20</u> |
| Guatemala City | Cia Guatemalteca Incatecu SA | | |
| <u>PERU</u> | | | <u>18</u> |
| Lima | Fabrica de Calsado Peruano SA (Bata) | | <u>18</u> |
| <u>URUGUAY</u> | | | <u>164</u> |
| Montevideo | (FUNSA) Fabrica Uruguaye de Neumaticos SA | 360 | |
| Montevideo | Radesca y Cia | N.A. | |
| <u>FAR EAST and SOUTH PACIFIC</u> | | | <u>21,988</u> |
| <u>AUSTRALIA</u> | | | <u>8,606</u> |
| Brisbane | Olympic Tire & Rubber Co., Ltd. | | |
| Melbourne | Kelworth Rubber Ltd. | | |
| Sydney | Dunlop Rubber (Aust.) Ltd. | | |
| Sydney | Goodyear Tire & Rubber Co. (Aust.) Ltd. | | |
| <u>INDIA</u> | | | <u>4,200</u> |
| Pombay | Firestone Tire & Rubber Co. of India Ltd. | | |
| Calcutta | Bata Shoe Company | | |
| Calcutta | Dunlop Rubber Co. (India) | | |
| <u>JAPAN</u> | | | <u>11,984</u> |
| Kobe | Dunlop Rubber Co. (Japan) Ltd. | | |
| Kobe | Nippon Tire Co. | | |
| Yokohama | Yokohama Rubber Co. | | |
| <u>NEW ZEALAND</u> | | | <u>1,200</u> |
| Auckland | Reid Rubber Tire Factory | | |
| | Atlas Rubber Co. | | |
| Christchurch | Firestone Tire & Rubber Co. | | |
| (Upper Hutt) | Dunlop Rubber Co. | | |
| <u>EUROPE including ENGLAND</u> | | | <u>86,821</u> |
| <u>AUSTRIA</u> | | | <u>1,956</u> |
| Wimpassing) Traskirchen) | Semperit | | 1,480.8 475.2 |
| <u>BELGIUM</u> | | | <u>2,500</u> |
| Antwerp | Wauters | | |
| Molines | Caoutchouc Recupere SA | | |
| Seneffe | Caoutchouc & Ebonite | | |
| <u>DENMARK</u> | | | <u>300</u> |
| Copenhagen | Schinning & Arve | | |
| Copenhagen | Danske Galochs & Gummifabrik | | |

APPENDIX A. (Cont'd)

| <u>Location</u> | <u>Name of Plant</u> | <u>Design Capacity^{a/}</u> (in long tons) | <u>Production^{b/}</u> |
|----------------------------|--|---|--------------------------------|
| <u>FINLAND</u> | | | 331.5 |
| Nokia | Soumen Gummitehdas Oy | | 331.5 |
| <u>FRANCE</u> | | | N.A. |
| Colombes | Wattaies Regenere | | |
| <u>GERMANY, WEST</u> | | | 27,355 |
| Hamburg-Harburg | Harburger Gummiwaren-Fabrik Phoenix AG. | | 3,600 |
| Hamburg | Deutsches Gummi-Regenerierwerk Wolfgang Krohn & Co. | | |
| Melle-Hannover | Melco K.G. Carl Boesch | | |
| Mannheim-Rheinau | Rhein-Chemie GmbH | | |
| Hannover | Continental Gummiwerke AG. | | |
| Hannover | Vorwerk & Sohn | | |
| Hannau-Main | Dunlop Rubber Co. | | |
| <u>GREECE</u> | | | N.A. |
| Athens | Aristovoulos Pentzotakis | | |
| <u>ITALY</u> | | | 2,500 |
| Milano | Pirelli | | |
| Torino | Pirelli | | |
| <u>NETHERLANDS</u> | | | 1,600 |
| Hague | N.V. Nederlandse B.F. Goodrich Co. | | |
| Haarlem | N.V. Rubber, Asbest- en Ebenitfabriken | | |
| <u>NORWAY^{d/}</u> | | | 500 |
| <u>PAKISTAN</u> | | | 100 |
| Karachi | Bata Shoe Company | | 32 |
| <u>PORTUGAL</u> | | | 300 |
| Oporto | Manufactura Nacional de Borracha, SARL (MABCR) | | |
| <u>SPAIN^{e/}</u> | | | 10,000 |
| Aso | Barakaldo | | |
| Bilbao | Firestone Hispania | | |
| Barcelona | J. Codina Villalonga, Fabrica de Caucho Regenerado Gomas y Amiantos | | |
| Torrelabelaga | Continental Rubber Co. | | |
| <u>SWEDEN</u> | | | 2,500 |
| Norkoping | Goodyear Tire & Rubber Co. (planned) | | |
| Trelleberg | Tellebergs Gummifabriks | | |

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APPENDIX A. (Cont'd)

| <u>Location</u> | <u>Name of Plant</u> | <u>Design Capacity^a</u> (in long tons) | <u>Production^b</u> |
|-----------------------|--------------------------------------|--|-------------------------------|
| <u>SWITZERLAND</u> | | | <u>150</u> |
| Alt Dorf (URI) | Doestwizler | | |
| <u>UNITED KINGDOM</u> | | | <u>36,729</u> |
| Birmingham | Dunlop Rubber Ltd. | | |
| Leyland | British Tire & Rubber Co. (Goodrich) | | |
| London | Rubber Improving Co. | | |
| Wolverhampton | Goodyear Tire & Rubber Co. | | |
| <u>YUGOSLAVIA</u> | | | <u>N.A.</u> |
| <u>AFRICA</u> | | | <u>N.A.</u> |
| <u>SOUTH AFRICA</u> | | | <u>N.A.</u> |
| | <u>GRAND TOTAL</u> | | <u>486,969</u> |

- a. This list of plants producing reclaimed rubber is far from complete. It is noted, however, that most large tire manufacturers also have facilities for reclaiming rubber. The importance of reclaimed rubber production has been greatly ignored in reports assessing the raw material supply of the rubber industry, and information on such facilities is meagre.
- b. Capacity figure of plants and/or of the entire country are given where available.
- c. Production of reclaimed rubber by country (and by plant when available) are given.
- d. An additional plant with 1,200 tons p.a. capacity was planned for completion by the end of 1951.
- e. There are reported to be 15 factories reclaiming rubber in Alicante alone.

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